New Nouveau Brunswick

DISCUSSION PAPER:

MINERAL RESOURCE POLICY FOR NEW BRUNSWICK

Department of Natural Resources and Energy
April 1992

DISCUSSION PAPER:

MINERAL RESOURCE POLICY FOR NEW BRUNSWICK

Department of Natural Resources and Energy
April 1992

NOTE

This discussion paper is intended for consultation purposes only and does not establish government policy. Input received during consultation will be used in formulating a new mineral policy for New Brunswick.

92-04839/

EXECUTIVE SUMMARY

This paper describes the mineral industry of New Brunswick, the role of various government agencies, issues affecting the mineral sector and policy options addressing these issues. The document is intended as a basis for discussion during consultation with industry and other interested parties. The inputs received during consultation will be utilized in preparing a new mineral policy for the province.

The Province, as the owner of New Brunswick's mineral resources, has a major role in the development of mineral resources. With a new mineral policy, the government's aim is **to ensure that the mineral industry's contribution to the provincial economy and the quality of life for New Brunswickers is sustained and enhanced.** The following issues, objectives and options of the draft policy are outlined in the paper:

ISSUE 1: Insufficient and declining ore reserves
Objective: **To aid and encourage increased private sector exploration**
Options: Strengthen exploration incentives, accelerate geoscience mapping and mineral deposit investigations, improve the geological database, increase promotion and advisory services, support geoscience education.

ISSUE 2: Reliance on Base Metals, Low Recovery from Base Metal Ores, Limited Value Added Activity
Objective: **To promote development of new and existing facilities through technological improvements in metal recovery, stimulation of in-province processi..g, and diversification of minerals produced**
Options: Strengthen incentives for technology development and processing, increase information exchange and training, continue research and development, support demonstration projects, monitor industry productivity, prepare information packages and development plans, strengthen the Department of Natural Resources and Energy role in marketing.

ISSUE 3: Coordination of the approval process and government-industry contact
Objective: **To consolidate and streamline regulatory requirements and to improve the coordination of government agencies and government interaction with industry**
Options: Streamline regulatory requirements and the approval process, provide "one-window-shopping" to industry, review coordination mechanisms with other agencies, define agency roles in mineral processing, establish an Advisory Board to the Minister, prepare a policy framework for specific minerals, revise administration of the federal-provincial agreements.

ISSUE 4: Environmental Concerns

Objective: **To address mine reclamation issues and to incorporate the principles of sustainable development into the management of mineral resources**

Options: Prepare and implement a sustainable development strategy for the mineral sector, support research and demonstration projects, continue support for review of tax treatment of reclamation costs, review the requirements for reclamation security, establish a provincial fund for reclamation of abandoned and closed mines, establish a government-industry task force on environmental issues.

ISSUE 5: Poor public awareness of the mineral sector

Objective: **To identify public concerns and to improve public information and awareness regarding the mineral industry**

Options: Establish an industry-government Committee to expand the public information program, survey public perceptions regularly, prepare public consultation guidelines.

ISSUE 6: Demand for geoscience information for non-mineral uses

Objective: **To provide geoscience information and input to planning and development projects not related to the mineral sector**

Options: Define the responsibility for providing geoscience information for non-mineral uses, establish an interdepartmental committee to identify geoscience needs, develop a geoscience program to serve such needs.

TABLE OF CONTENTS

		Page
	EXECUTIVE SUMMARY	i
	TABLE OF CONTENTS	iii
	LIST OF FIGURES	iv
1.0	INTRODUCTION	1
2.0	INDUSTRY PROFILE	2
2.1	Importance of the Mineral Sector to New Brunswick	2
2.2	History of Mineral Policy	3
3.0	NEED FOR POLICY REVIEW	5
4.0	ROLE OF GOVERNMENTS	8
4.1	Provincial Government	8
4.2	Federal Departments and Agencies	10
4.3	Other Agencies	10
5.0	MINERAL POLICY OPTIONS	11
5.1	Increased Mineral Exploration	11
5.2	Promoting Development of Existing and New Facilities	14
5.3	Coordination of Government-Industry Interaction	19
5.4	Environmental Concerns	22
5.5	Public Awareness	25
5.6	Non-mineral Use of Geoscience Information	27
6.0	CONCLUSION	29
7.0	REFERENCES	30
8.0	APPENDIX A	32

LIST OF FIGURES (APPENDIX A)

Figure 1	Value of Mineral Production in New Brunswick 1950-1990
Figure 2	Mineral Production in New Brunswick 1991
Figure 3	Value of Mineral Production by Commodity, 1975 Versus 1989
Figure 4	Total Exploration Expenditures in New Brunswick 1950-1990
Figure 5	Exploration Expenditures in N. B. by Commodity 1983-1990
Figure 6	Mineral Reserves and Economic Benefits
Figure 7	Employment in the Mineral Sector (Actual and Projected)
Figure 8	Projected Yearly Concentrate Production from Selected Sulphide Deposits
Figure 9	Major Mineral Developments in New Brunswick (1990 Map)
Figure 10	Mine Approval Process

MINERAL RESOURCE POLICY FOR NEW BRUNSWICK

1.0 INTRODUCTION

This paper describes the mineral industry of New Brunswick, the role of various government agencies, issues affecting the mineral sector and policy options addressing these issues. This document is intended as a basis for discussion during consultation with industry and other interested parties. The inputs received during consultation will be utilized in preparing a new mineral policy for the province.

A new mineral policy will ensure that the mineral industry's very significant contribution to the provincial economy will be sustained and enhanced. The policy is intended to assure industry of the government's commitment to the development of the resource, the competitiveness of the sector, and the long term stability of the development climate.

The Province is the owner of New Brunswick's mineral resources. The Mineral Resources Division (MRD) of the Department of Natural Resources and Energy is responsible for managing and developing New Brunswick's mineral resources in the best interests of present and future generations of the province.

The quality of life of all citizens of the province is affected by the health of the mineral sector, in terms of government revenues, direct and indirect employment, and protection of the environment.

As a commodity based industry, the mineral sector is directly affected by the price of minerals and metals. Because minerals are non-renewable resources; exploration, ore reserves, processing efficiency, market conditions, and value added are essential considerations in maximizing economic benefits over the long term. Sustaining the investment climate and protecting the environment are also important in considering future mineral development. Maximizing income from the sector cannot be achieved without active support and cooperation from governments, investors, management and labour. Integration within and between federal and provincial departments is imperative to realize optimum economic benefits for the province.

The government's role is one of a catalyst; the industry must be the developer. The new policy will be designed to address changing conditions on both the supply and demand sides of the market and will emphasize a proactive strategy to mineral development. Traditionally, emphasis has been placed on mineral supply and near future goals. The new policy will encompass a longer term view, that is, ten to twenty years, and will provide both a direction and goals for government involvement. It will be necessary to address competitive advantage and to encourage further processing of the

resource in the province. The policy must be clear and supportive, and be aimed at sustaining the existing contribution from the sector and enhancing future contributions.

2.0 INDUSTRY PROFILE

2.1 IMPORTANCE OF THE MINERAL SECTOR TO NEW BRUNSWICK

The mineral sector is an essential part of the New Brunswick economy. In 1991, it employed 5,000 people directly and an estimated additional 5,000 indirectly. Direct employment in the industry provides salaries and wages in the order of $150 million annually. In addition, the industry purchases $200 million in goods and services and $52 million in electricity each year. In 1990, the average wage in the mining sector in New Brunswick was $713 per week as compared to the New Brunswick Industrial Aggregate Wage of $463 per week. In order for the industry to flourish and continue to provide this level of benefits, a minimum of 10,000 direct and indirect jobs must be maintained and approximately $1 billion (1991 dollars) per year in production value must be ensured. It has been suggested that a two per cent growth in the real value of production be established as a goal. This suggestion is based on recent projections for growth in mineral markets. Realization of these goals will require substantial cooperation between industry and governments.

In New Brunswick, eighteen mineral commodities are produced as shown in Figure 2, Appendix A. There are over 25 active mining operations ranging from large base metal mineral producers to aggregate operators. The value of the minerals produced each year has grown from $535 million in 1981 to $909 million in 1989. Between 1981 and 1990, production value has grown at an average rate of 5.8% per year. However, in 1990 and 1991 the value of production declined to $886 and $617 million respectively due to lower metal prices and because of a lengthy strike at Brunswick Mining & Smelting operations. Almost 65% of the total production value is contributed by zinc, lead and copper. Zinc and potash are presently the largest value producers and provide 75% of the direct employment in the sector. The Brunswick No. 12 mine, in northern New Brunswick, is one of the largest zinc mines in the world. New Brunswick's major lead-zinc mines were discovered in the 1950's and began production in the 1960's. The potash operations were developed as a result of a government funded and directed drilling program. Potash production began during the 1980's.

Much of New Brunswick's mineral production is exported. In 1989, mineral exports accounted for approximately 12.3% of the province's total exports. Potash exports alone from New Brunswick's two mines in Kings County totalled $117.7 million or 4% of total domestic exports during 1990.

The known mineral deposits in the province include lead-copper-zinc sulphides in the Bathurst-Newcastle region, tin-tungsten-molybdenum in the Mt. Pleasant area in

Charlotte County, and gold bearing zones near the Bay of Fundy, and in northern New Brunswick. In 1991, mineral exploration expenditures by the private sector totalled $21 million. Exploration has played an important role in developing and maintaining lead and zinc production, and, is essential to building and supporting future processing and allied industries. The timing of exploration is also important; revenue may not be realized from a new mine for 5 to 10 years after start-up, and 15 to 20 years of feed is necessary to support investment in further processing facilities.

The Canada-New Brunswick Cooperation Agreement on Mineral Development (C-NB CAMD) effective from 1990 to 1995 will see $10 million dollars directed toward geoscience data gathering, technology development, economic studies and public information projects aimed at promoting mineral development and productivity. This supplements the Mineral Resource Division's (MRD) "A" Base Budget of $3 million per year. In addition to the C-NB CAMD and MRD budgets, a portion of the federal budget is directed to Energy, Mines and Resources Canada (EMR) to support programs in New Brunswick. The latest mineral development agreement (1990-1995) funding is approximately half that of the previous agreement ($23 million), creating limits to the nature and scope of the projects undertaken.

In recent years the industry has experienced increasing global competition, restructuring, decreasing margins, volatile prices and exchange rates, increased regulation, removal of trade protection, and recessions affecting the automotive and construction industries upon which major mineral markets are based. Investment in the sector therefore has significant risk and funds are highly mobile.

New Brunswick is fortunate in having competitive advantages such as a rich variety of mineral resources, good infrastructure including port facilities, reasonable power rates, established markets, access to U. S. markets due to the Free Trade Agreement, and close proximity to American markets. However, increased international competition has kept metal prices low while local costs have risen, and factors external to the province such as exchange rates and interest rates have negatively affected sector profitability. Technological challenges such as milling difficulties for New Brunswick base metals ores and control of acid mine drainage cause difficulties locally. Poor integration of the metal processing, manufacturing and related industries with exploration and mining has resulted in the loss of potential economic benefits.

2.2 HISTORY OF MINERAL POLICY

Prior to 1982, New Brunswick's mineral policy was reflected mainly in the Mining Act, Metallic Minerals Tax Act, Ownership of Minerals Act and Quarriable Substances Act. The Mining Act establishes rights to access Crown-owned minerals for exploration and development. It also provides a process for mineral exploration, mine development, production and reclamation activities. The provincial mineral legislation relates to all

phases of development except manufacturing and recycling. The Mining Act applies to metallic minerals, coal and potash.

The Metallic Minerals Tax Act is aimed at providing a fair return to the Province for use of non-renewable resources while encouraging further processing in the Province and increasing exploration activity. The taxation legislation is designed to address issues of fairness, equity, neutrality relative to taxation in other sectors, and simplicity of administration. The mineral legislation also aims to encourage economic development and optimum use of the resources, providing conditions for profitable and competitive operations. Since 1970, the federal-provincial agreements on mineral development have provided additional means to implement these objectives.

Other acts, including the Quarriable Substances Act, the Oil and Natural Gas Act, Bituminous Shale Act, the Underground Storage Act and the Pipe Line Act, address the development of non-metallic minerals (sand, gravel, peat, oil and natural gas and oil shales). Most legislation relating to minerals is administered by the Mineral Resources Division of DNRE, however, legislation affecting energy-related minerals is administered by the Energy Branch of DNRE.

In 1982, a provincial policy paper entitled Mineral Strategy Update was released. It identified the following objectives:

(a) expansion and diversification of the resource base
(b) acceleration of development of known deposits
(c) improved recovery at existing and future operations, and,
(d) increased level of in-Province processing.

In 1984, the mineral policy was updated in an economic strategy for New Brunswick entitled Meeting the Challenge of the Eighties.

The Mineral and Metal Policy of the Government of Canada was released in May 1987. In this policy, the federal government outlined support to the provinces and to industry in development of the provincially-owned and regulated mineral resources. The federal policy focused on providing a fair and balanced fiscal and regulatory framework, promoting regional economic development, improved technological performance, assistance with industrial adjustments, promotion of exports and access to international markets, and providing economic and technical information.

In 1989, the Province released Toward 2000 - An Economic Development Strategy for New Brunswick. With respect to mineral resources, the strategy indicated that:

> "The government will design programs for industry that will help identify new deposits, develop known deposits and strengthen existing mines . . . renew efforts

to see a zinc reduction plant here . . . negotiate a new mineral development agreement." (page 44, Toward 2000)

Since the release of the strategy, the Province has introduced a new exploration policy for potash, signed a new five year mineral development agreement with the federal government and is reviewing options for further processing of base metals in northern New Brunswick. In more general terms, Toward 2000 highlighted investment in skills for workers, promotion of small business development, improved infrastructure and investment climate, enhancement of New Brunswick's environment and natural resources, equity in economic development, and promotion of the Province's identity.

3.0 NEED FOR POLICY REVIEW

The existing policies and mineral legislation need to be examined at this time since there have been significant changes in both the industry and economic circumstances. Questions concerning the degree of success in meeting the policy objectives, changing public demands and revision of other legislation also need to be addressed. The past policies appear to have had limited success in promoting increased exploration, mine development and enhanced processing. A notable exception is the drilling program carried out by the government that led directly to the establishment of the potash industry, although such activity is not usually undertaken by government.

The single most important concern for the province is the discovery of new reserves. Dwindling mineral reserves adversely affect future investment in exploration, development, processing, and related industries. Without mineral reserves exceeding 15 to 20 years, value added processing and other associated operations are not likely to be undertaken. Although the potash reserves are expected to be sufficient to support production until 2012, the lead-zinc-silver reserves of the province require attention. The reserves of lead-zinc-copper-silver for the Brunswick No. 12 mine will be depleted by 2014, and, seven other base metal deposits have potential reserves ranging from 1 to 14 years (See Figure 8, Appendix A). No new reserves have been identified at Brunswick No. 12 to replace the ore being removed each year. Although production based on the Brunswick No. 12 reserves is expected to continue until 2014, the rate of mine production and the associated benefits will be reduced, starting in 1999.

Information shown in Figures 1, 2, 6 and 7 indicates New Brunswick's heavy reliance on the base metal industry and specifically on the Brunswick Mine No. 12 for long term value of production, employment and other economic benefits. Figure 6 also shows that only the Brunswick Mine No. 12, the two potash mines, peat operations and N. B. Coal Ltd. have reserves exceeding 20 years of production. The contribution that potash, a non-metallic mineral, has made to diversifying the sector is demonstrated in Figure 3, Value of Production, 1975 Versus 1989. Employment in the sector is expected to decline by 1400 jobs over the next 10 years, based on existing reserves and production

forecasts (See Figure 7). Based on these tables, it is obvious that the province must find new reserves, diversify the type of minerals produced, optimize metal recovery, and, encourage a higher level of processing within the province. Finding additional reserves requires long range planning and investment in geoscience programs. If maximum benefits are to be realized, additional reserves must be proven and the decisions to build processing facilities to utilize known reserves must be made in the near future. At the same time, making plans and provisions for the eventual depletion of individual large mines also requires consideration.

In recent years, trade agreements, growing international competition, rising costs and declining prices, and the restructuring of the industry into larger integrated companies have altered industry conditions. A number of issues have also surfaced within the province which indicate a need to review mineral policy. These include land use controls, conflicts with landowner's rights, environmental policies, environmental concerns of the public, and, overlapping mineral resource management responsibilities. Market trends, such as the use of substitutes and a lower intensity use of metals per product have influenced the demand for concentrates and metals. With the recent structural changes in the economy and in industry needs, corresponding adjustments in the governments' roles are necessary.

The current constitutional debate may result in changes being made to the responsibilities of the federal and provincial governments in the mineral sector. Such changes would require the provinces to review their policies so that necessary support to the sector is continued. Federal activities which would be immediately affected include the statistics service, mineral commodity information, support to intergovernmental working groups, national representation at international conferences, mineral development agreements and international trade missions. The general mapping and other services of the Geological Survey of Canada and the research work carried out by CANMET are not expected to be affected. For the affected areas, however, cooperative agreements between the provinces may be necessary since individual provinces will not be equipped to deal with withdrawal of certain federal services. In addition, the evolution of Maritime Economic Union may influence the provincial policy development, priorities and institutions with respect to the mineral sector. It will be necessary for these changes in government roles to be reflected in the new mineral policy.

Industry associations and other interested parties have made some recommendations regarding industry needs and the government's role in supporting economic benefits and management of resources. The Mining Association of Canada (MAC) has identified the following "government-related issues" for the attention of provincial Mines Ministers (48th Annual Mines Ministers' Conference, September 1991):

(a) environmental performance in the mining industry
(b) growing regulation of mining: uncertainty and the burden of compliance
(c) mine reclamation, decommissioning and post-closure obligations
(d) an unfavourable public image of mining
(e) access to and use of lands for mineral exploration and development
(f) attaining adequate levels of education, training and skills and satisfactory human resources, and,
(g) government management of the economy, the investment climate and the infrastructure for mining.

The Prospectors and Developers Association (PDA) has also represented its concerns to the Mines Ministers. The Association has recommended that the government clearly and unambiguously recognize and support the mineral industry's central role in the economy and affirm the government's mandate to expand the mineral industry. The PDA has encouraged a review of federal taxation policy, financial incentives and monetary policy with the goal of fostering investment in natural resource industries in Canada. The PDA also has supported building competitiveness based on existing strengths within the Canadian mineral sector, including efficiency, advanced technology and environmental responsibility. In order to reduce jurisdictional overlap, enhance compliance and foster investment, the development of a clear, coordinated, practical set of regulations is advocated by the PDA. Finally, the PDA wants strategies for industrial development to focus on the natural resources sector with its existing strengths rather than on new high-technology industries.

An operational review of the Mineral Resources Division was recently conducted by a consulting firm. Recommendations from the report include increasing the promotional role of MRD, reviewing the geological database systems and improving the MRD contact with industry. The report suggested that industry needs include a clear, long term commitment with respect to government policy and funding, clarification of government agency roles, improved government-industry coordination and cooperation, and a review of tax-fiscal structures to provide incentives for the industry. Additionally, increasing geoscientific information and funding, improving the Province's competitiveness, clarifying sustainable development, providing input into land use and environmental legislation, and improving the industry's image were suggested.

Representations from regional bodies concerned with economic development in the province have also requested policy review. For example, the Nepisiguit Economic Conference, a group from the Chaleur region of northern New Brunswick, has indicated that the government has failed to respond to sectoral concerns and follow through on initiatives. The group has proposed four projects related to exploration, education, acid mine drainage and financial programs to help the mineral industry prosper. These include intensive geological mapping of the Bathurst Camp region, development of geological training as part of school curriculum and an expanded geoscience information program, till mapping and tailings reprocessing as part of controlling acid drainage, and

evaluation of financial incentives for mineral exploration and development. The province is already supporting the preparation of geological information for inclusion in the school curriculum.

Michael Porter, a business consultant advising the Business Council on National Issues and the federal government, advocates stronger emphasis on innovation, building "industry clusters," and increased sophistication of the natural resource sector based on productivity, technology, skills, and sophisticated, differentiated products. He has also stressed that Canada's industrial and economic development must be based on competitive advantage rather than other goals. Other recommendations include providing a dynamic investment climate, identifying and building on sources of competitive advantage, improved inter-governmental policy co-ordination, and, maintenance of an open policy toward foreign investment. He has urged governments to provide high quality infrastructure, assistance in research and development, and, training programs to support industry competitiveness.

The mineral policy of the Province has always emphasized developing additional processing facilities and promoting development of the sector. The changing economic and competitive forces affecting the mineral industry, limitations of the known reserves, and issues identified by industry associations, governments, consultants and other parties illustrate the need for a review of the mineral policy for Mineral Resources Division.

4.0 ROLE OF GOVERNMENTS

4.1 PROVINCIAL GOVERNMENT

The mandate of the Mineral Resources Division (MRD) of the Department of Natural Resources and Energy (DNRE) is to manage the Province's mineral resources in the best interests of the citizens of the Province. The Division's activities include investigation and mapping of the surficial and bedrock geology of the province, assessment and promotion the mineral resource potential and its exploration, and, economic and financial analysis for development planning. The Division's activities in mineral development encompass promoting investment in and development of the Province's mineral resources, administering various Acts, providing statistics, data regarding mineral rights and information concerning legislation, and reviewing production and extraction operations. Mineral development frequently affects resources regulated by other branches of DNRE. These include forest resources, Crown land management, public recreation, fish and wildlife resources, energy policy and ecologically sensitive areas.

Within the provincial government, the Mineral Resources Division interacts with several departments including the Department of the Environment (DOE), the Department of Advanced Education and Labour (AEL), the Department of Economic

Development and Tourism (DEDT), and, the Department of Finance (DOF). The MRD also interacts with the Department of Justice, the Department of Municipalities, Culture and Housing, and the Department of Transportation.

For new and existing mineral projects, the Mineral Resources Division works closely with the provincial Department of the Environment on environmental quality, reclamation, sustainable development and land and water use issues. DOE administers regulations pertaining to environmental impact assessment, watercourse alterations, water quality, air quality, hazardous wastes, waste disposal and protection of watersheds. DOE also works with the federal Departments of Environment and Fisheries and Oceans on similar matters. Obviously, mineral sector activity and MRD responsibilities affect environmental conditions and require coordinated planning and action by industry, MRD and DOE. The Standing Committee on Mining and the Environment assists in the coordination of the approval process and in issue management.

The Department of Economic Development and Tourism promotes manufacturing activity and small business, and provides financial assistance and market information to industry. DEDT 's objective is to sustain, strengthen and expand employment opportunities in the manufacturing and processing sector. The DEDT role in promotion and processing overlaps with DNRE's responsibilities for processing and promotion as part of the MRD mandate for mineral development. Improving coordination or possibly centralizing the activities in Mineral Resources Division, much as the fishery and agriculture departments have done, should be evaluated.

The Department of Advanced Education and Labour (AEL) administers legislation pertaining to collective bargaining, employment standards, occupational health and safety, human rights, and worker's compensation funding. AEL designs and implements employment development programs in response to labour market needs, and, provides labour market analysis and adjustment services.

The provincial Department of Finance provides input to the provincial budget and advice to Cabinet on taxation and fiscal matters. It also develops taxation and revenue policy, and administers specific taxation statutes. MRD and the federal government also administer separate taxation legislation.

The Regional Development Corporation (RDC) provides banking services to the province for federal-provincial agreements related to economic development. In this capacity, RDC is involved in the negotiation and administration of the federal-provincial agreements on mineral development. The MRD plays a central role in the planning, negotiation, administration and technical input for such agreements.

4.2 FEDERAL DEPARTMENTS AND AGENCIES

Energy, Mines and Resources Canada (EMR) is a federal agency which gathers and disseminates information regarding mineral commodities and markets, international issues, national mineral policy, and, taxation. EMR also conducts trade missions, carries out technological research, basic geological mapping, and provides financial support to the mineral industry. EMR focuses much of its attention on technology development. Another federal agency, the Atlantic Canada Opportunities Agency (ACOA), promotes regional economic development through financial support to industry. The 1990-1995 federal-provincial agreement involves DNRE and EMR in the administration and technical side, and RDC and ACOA provide banking services and coordination with other economic development agreements.

Also on the federal level, Industry, Science, Trade and Commerce is actively involved in trade missions, research and technology including that related to the mineral sector. The federal Department of Finance develops and implements fiscal and monetary policies, taxes and incentives. All of these measures have a direct and indirect impacts on the mineral industry. There is a need to avoid overlap and duplication currently existing between federal departments and the Mineral Resources Division of DNRE.

4.3 OTHER AGENCIES

In addition to coordination of various government agencies, liaison and cooperation with labour, management, and industry associations such as the Mining Association of Canada (MAC), the N. B. Prospectors and Developers Association (PDA) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) is essential. Coordination of the MRD function with other participants and industry supporters presents a significant challenge. Standing Committees, advisory groups and other means of closer and more direct industry-government linkage will be evaluated.

5.0 POLICY ISSUES, OBJECTIVES AND OPTIONS

The following major issues, objectives and options will be addressed in the new mineral policy:

5.1 INCREASED MINERAL EXPLORATION

ISSUE:

Insufficient and Declining Ore Reserves

OBJECTIVE:

To aid and encourage increased private sector exploration

POLICY OPTIONS:

(i) **Strengthen Exploration Incentives:** Existing incentives and possible new incentives would be evaluated. The existing measures to stimulate exploration include the Mineral Exploration Stimulation Program (MESP) and tax considerations.

(ii) **Accelerate the Rate of Surficial and Bedrock Mapping:** At the present rate of mapping the "Bathurst Newcastle Camp" area, information to assist private companies in finding new reserves will take 30 years to complete, but the data is needed by industry within the next ten years in order to replace declining base metal reserves. Mapping of other areas with potential for commercial development could also be accelerated. A large part of the province has not yet been subject to detailed geoscientific examination.

(iii) **Accelerate Mineral Deposit Investigations:** Data on deposits must be compiled, updated, and expanded to develop new geological interpretation and prepare packages for promotion and development purposes. Maintaining a computerized mineral deposits file and accelerating the investigation program for 30 to 40 significant deposits are important to encourage exploration.

(iv) **Improve Geological Database:** The geoscience database for New Brunswick is very large and has become increasingly difficult to manage. Accelerating the rate at which data is digitized and entered into the CARIS-based Geoscience Information System would facilitate improved management of the geoscience data.

With a new schedule and increased resources this work could be completed in five to ten years rather than twenty years.

(v) **Increase Promotion and Advisory Services:** Promoting investment opportunities in New Brunswick's mineral industry, for example through conferences, trade fairs and trade missions, is essential for the development of provincial mineral resources.

(vi) **Support Geoscience Education:** It is proposed that DNRE continue sponsoring prospecting courses, maintain support for the Economic Geology Chair at the University of New Brunswick and assist in upgrading the geoscience component of school science courses. Other possible support could be provided through the establishment of a university scholarship for geoscience study and contributions to symposia organized with other departments and the industry.

DISCUSSION

New Brunswick's mineral sector is heavily reliant on its base metals reserves. Over half of the economic benefits enjoyed by the province from the mineral sector are derived from mining and milling zinc, lead, copper, and silver minerals from the Brunswick Mining and Smelting No. 12 mine in northern New Brunswick. The production rate of this mine will gradually decline and its present reserves will be depleted by 2014. By 2000, the economic benefits from the mine are expected to be 30% less than in 1991. Heath Steele, another lead-copper-zinc mine, has reserves for only six years. Assuming that no new reserves are identified, there will be a significant reduction in economic benefits particularly to Gloucester, Restigouche, and Northumberland counties over the 1990-2000 period.

Privately funded exploration activity, specifically that aimed at locating lead, zinc and copper reserves, has not risen to the levels necessary to add to New Brunswick's resource base. In addition, the deposits which are easiest to find have already been located. At present, approximately $17-20 million of privately funded exploration is carried out annually in the province. Both industry and government staff consider this to be insufficient for locating reserves for new developments. Industry has indicated that exploration activity should be approximately three to four percent of the value of mineral production, equivalent to nearly double the 1990 exploration expenditures. Total exploration expenditures and exploration expenditures by commodity are shown in Figures 4 and 5, Appendix A.

Traditionally, mineral exploration is funded by private investment and the government's role is to aid and encourage private sector exploration so that new base metal and other mineral reserves can be identified. Reliable, detailed and up-to-date geoscience information provided by government reduces the risks taken by the privately

funded exploration companies and encourages investment in exploration.

The government's role is to stimulate exploration and identify areas of high potential for mineral resources. This is accomplished by bedrock and surficial geological mapping, geochemical and geophysical surveys, mineral deposit research and investigation, establishment of a database system and providing advice to mineral exploration companies and individual prospectors. Small stimulation grants and tax incentives are also provided to encourage exploration.

Generally speaking, New Brunswick has a broad-based, high quality, geoscience database which has served the sector well in addressing changing interests. However, in the next decade, the mineral database must be expanded to support new exploration campaigns in search of the more difficult-to-find deposits. Detailed studies of significant deposits should be accelerated and coordinated with detailed geological mapping. Future mineral development is dependent upon identification of new deposits and new reserves.

DNRE's 1992-93 annual budget for such geoscience activities is $1.4 million. In recent years, budget restraints have resulted in slowing both mapping work and the establishment of a database system. In addition to DNRE's budget, approximately $500,000 is provided annually through the Canada-New Brunswick Cooperation Agreement on Mineral Development (C-NB CAMD) for geoscience. CAMD funding will decline until 1995 when the current agreement terminates. It should be noted that the support for geoscience in the 1990-95 agreement is $8.6 million less than in the 1984-1989 agreement, causing geoscience activities to be significantly reduced.

5.2 PROMOTING DEVELOPMENT OF EXISTING AND NEW FACILITIES

ISSUE:

Reliance on Base Metals, Low Recovery from Base Metal Ores, Limited Value Added Activity

OBJECTIVE:

To promote development of new and existing facilities through technological improvements in metal recovery, stimulation of in-province processing, and diversification of minerals produced

POLICY OPTIONS:

(i) **Strengthen Incentives for Technology Development and Processing Activity:** Technological advantages and improvements in efficiency are essential to maintaining and improving competitive position. The CAMD funding and the Metallic Minerals Tax Act (MMTA) are intended to stimulate technological research and in-province processing, respectively. The effectiveness of these measures is in doubt due to the continuing low level of processing activity. It is important to evaluate the effectiveness of existing incentives to stimulate research and development in mining, milling and processing technology and to make changes where necessary. Conditions in competing jurisdictions and taxation issues such as harmonization of provincial and federal taxes also need to be considered.

(ii) **Increase Information Exchange and Training:** Increased participation by DNRE in technology-related activities and further development of a program for distribution of information, for example, through conferences, technology transfers, mining association activities and newsletters would promote development and implementation of new technologies in New Brunswick.

(iii) **Continue Research and Development:** It is assumed that the total funding from CAMD and industry for research and development in New Brunswick is equivalent to about $1.5 million per year, or approximately 0.2% of the value of mineral production. Research and development by private corporations is limited due to financial and technical constraints. The federal CANMET program and a small provincial laboratory (funded through the CAMD Agreement) provide direct research capability. The provincial research and development supports small scale operations and research related to specific provincial deposits.

Recognizing the limitations of private and CAMD funding for research, the direct involvement of government in research and development offers a means of continuing and possibly expanding technological research important to the New Brunswick mineral industry.

(iv) **Support Demonstration Projects:** Potentially viable technologies are often not implemented due to a lack of pilot scale testing. Further development of a program to support demonstration projects would offer an important tool for improving industry competitiveness. For example, demonstration of the ferric chloride leach technology is being considered based on CAMD and industry funding. If successful, this technology would provide significant advantages in developing and processing New Brunswick mineral deposits.

(v) **Monitor Industry Productivity:** At present, due to limited staff resources, the information collected concerning industry productivity and program effectiveness has not been fully utilized in program planning or in monitoring and assessing industry status and needs. Consideration could be given to enhancing DNRE's annual review of mine plans and operations, including analysis of recovery rates, facilities, industry productivity and competitiveness.

(vi) **Prepare Information Packages and Development Plans:** Information packages and development plans for minerals and mineral deposits (including geological information, an inventory of investment opportunities, processing potential and studies of market conditions, project feasibility, competitiveness and engineering) would encourage mineral investment and establishment of further processing within the province. Increasing New Brunswick's profile at conferences and seminars would provide an opportunity to develop technical expertise and to distribute development-related information.

(vii) **Strengthen DNRE's Role in Marketing:** Expanding DNRE's role in marketing would provide continuity, technical expertise and strong provincial representation. In cooperation with DEDT and EMR, DNRE could distribute information packages and contribute to conferences, open houses and trade missions in promoting New Brunswick's opportunities for mineral development.

DISCUSSION

To enhance mineral development, specifically the value of production and the future economic benefits to New Brunswick, several measures to promote existing and new mining and processing facilities could be evaluated. New Brunswick's reliance on, and low recovery from, base metal resources will be central factors in the design of mineral development initiatives. The focus of the policy review is technological improvements to base metal recovery, in-province processing, and diversification of the

mineral resources produced.

Improved Metal Recovery

Limitations in the technology for metal recovery from New Brunswick's sulphide ores (fine-grained complex ores from the Bathurst area) adversely affect the feasibility of new mines and development of marginal deposits. At base metal facilities, the typical grades of the mill feed are .42% copper, 3.28% lead, 8.44% zinc and 103 grams/tonne silver. During the milling process, in the order of 84% of the zinc, 61% of the lead, 77% of the copper and 62% of the silver content is recovered. The remaining zinc, lead, copper and silver are deposited as sulphide tailings, a waste product from the milling operations.

Since 1966, the Brunswick No. 12 mine has generated about 65 million tonnes (22 million cubic meters) of tailings. It is expected to produce an additional 80 million tonnes before existing reserves are depleted. It is estimated that the combined past and future tailings will contain lead, zinc, copper and silver value equivalent to over $5 billion. This represents a large loss of potential revenue to the company and to the Province. In addition to the financial loss, the sulphide tailings create significant mine reclamation difficulties, specifically acid mine drainage.

Development of new technology for milling and processing Bathurst-type ores and for reprocessing tailings is a priority both to improve the recovery of mineral value, and to address environmental and mine reclamation concerns. The Province has already devoted a significant effort to testing new technologies, for example, sulphation roast leach and ferric chloride leach. More efficient processing, for example, transforming concentrates into metals, is an important means of keeping more of the economic value in New Brunswick. It also improves the project feasibility, increases interest in exploration, mining and manufacturing projects, allows entrance into new markets, and with new technology, provides a vital competitive advantage.

At present, DNRE has two staff positions specializing in process engineering and mine engineering, and, has limited funding for laboratory facilities for test work. Industry has access to modest support from the CAMD agreement for applied research. The federal Department of Energy Mines and Resources Canada (EMR) conducts research and provides funding related to new technologies at a national level. The provincial Department of Economic Development and Tourism is involved in funding and planning for economic development, but has few resources for promoting value added mineral processing. Due to the severe impact on mineral development caused by limitations in base metal recovery, it is important that technology development for mining, milling and processing be emphasized.

Increased Value Added

Adding value to provincial mineral resources may involve refining metallic ores (for example, through beneficiation, milling, smelting, or leaching processes) or processing industrial minerals. Adding value may also include manufacturing of products containing metal or industrial minerals. For example, maximum recovery of the lead, zinc, silver, copper, cadmium and other commercially viable metals contained in base metal ores is important in managing the provincial mineral resource. The provincial aim is to recover the combined mineral content from the ores and produce metal and consumer products in the province rather than export unprocessed products.

For twenty years, New Brunswick has identified in-province processing of zinc concentrate as a priority and has used various approaches to improve the economic return for further processing of this resource. However, with the exception of lead, all base metal concentrates from local mines are exported without additional processing. Although some minerals, such as potash have limited potential for further processing, most have potential for more value to be added within the province. Further processing of other minerals such as molybdenum, tungsten, tin, indium, manganese, shale, limestone, silica and base metals within the province is desirable in order to the realize the economic benefits and the full value of New Brunswick's mineral resources. In addition to stimulating new processing activities, maintaining and modernizing the existing lead smelter at Belledune, which employs 450 persons, is of concern.

At present, both DNRE and the Department of Economic Development and Tourism (DEDT) have responsibility for developing processing and value added activities related to mineral resources. An interdepartmental committee on processing, bringing together five departments including DNRE and DEDT, has been established to promote new processing facilities for base metals, particularly zinc. DNRE presently has responsibility for all aspects of mineral resource management and development, and, the Department is a source of technical expertise and a central contact with industry. DEDT has access to funding for economic development (studies and demonstration projects), but has limited resources specific to mineral processing and marketing.

DNRE has had a very small role in marketing and promotion but has direct contact with investors and developers. International trade missions and market promotion are supported mainly by Energy Mines and Resources Canada (EMR). At the provincial level, DEDT is involved in limited marketing activities for mineral resources. EMR and DEDT often work independently from the Mineral Resources Division of DNRE on marketing.

Because no new base metal processing facilities have come on stream recently, it may be concluded that the present incentives (tax incentives, promotional work, government policies) are not effective in stimulating value added processing and manufacturing. Marketing support and providing a competitive investment climate are

considered important in sustaining the sector and its associated benefits. Recent intense global competition (e.g. relatively lower costs and attractive incentives in South America, Pacific Rim countries and Australia) have changed the market and investment conditions significantly.

Mineral and Product Diversification

New Brunswick's heavy reliance on base metals, specifically zinc, suggests that diversification to other minerals is an attractive option for stabilizing the volatile returns from base metals. In 1975, 85% of New Brunswick's value of mineral production was from metals. In 1989, the share of the value of production from metals had decreased to 67% due mainly to an increase in potash production. Forecasts indicate that the value of base metal production will continue to decrease and employment benefits will be reduced due to declining reserves, lower production rates and pressures for increased productivity. Fourteen hundred jobs may be lost in the base metal industry by 2010, if additional reserves are not found by 2000.

Development and production of other minerals such as industrial minerals, rare metals, graphite, precious metals, coal and peat will be considered in order to reduce New Brunswick's reliance on base metals and the declining base metal reserves. Product diversification offers a method of increasing the stability of the sector and protecting tax revenues by dampening the effect of price variations.

At present, DNRE has staff with expertise in industrial minerals. Additional market research, inventories, geological information, processing research and development, promotional work and incentives would stimulate diversification. The diversification of minerals and products would complement the previously mentioned initiatives aimed at adding value to existing products and advancing technological development.

5.3 COORDINATION OF GOVERNMENT-INDUSTRY INTERACTION

ISSUE:

Coordination of the approval process and government-industry contact

OBJECTIVE:

To consolidate and streamline regulatory requirements and to improve the coordination of government agencies and government interaction with industry

POLICY OPTIONS:

(i) **Streamline regulatory requirements and approval process:** The regulations applicable to mineral development activities are complicated and often involve several government agencies. In addition, the approval process is time consuming. Consolidating and streamlining the mining and environmental regulations and the administrative process affecting the mineral sector is considered a priority. Preparation of a guide to the regulations and approval process and examining the possibility of regulating the removal of sand and gravel from freehold lands are also proposed for consideration.

(ii) **Provide "one-window-shopping" to industry:** The mineral industry must maintain contact with government (for information, funding, regulatory requirements, etc.) through a large number of agencies. Since DNRE has responsibility for management of the province's mineral resources, it seems appropriate that DNRE become the industry's central contact in government providing coordination of government-industry interaction.

(iii) **Review coordination mechanisms:** To improve coordination of the regulatory and planning role of the government with the mineral industry, review of DNRE's formal coordination mechanisms with the following departments has been proposed:

(a) the provincial and federal Departments of Finance (re: taxation policies)

(bi) the Workers' Compensation Board and the Occupational Health and Safety Commission (re: research and development regarding safety issues)

(c) the N. B. Department of Municipalities, Culture and Housing, and the Department of the Environment (re: land use issues)

(d) the Department of Advanced Education and Labour, in association with industry (re: training, skills upgrading and adjustment needs, labour and human relations issues)

(e) the provincial Department of Economic Development and Tourism, and the federal Department of Energy, Mines and Resources (re: promotion, development, funding).

(iv) **Define Agency Roles in Mineral Processing:** Presently, both DNRE and DEDT have responsibilities in promoting mineral processing (eg. production of metal from concentrate) causing a lack of clarity for industry and government staff regarding the mandate, continuity and accountability. It is suggested that DNRE be responsible for mineral resources from the ore phase up to and including production of metal, and that DEDT be responsible for promoting the manufacture of products from metals.

(v) **Establish Advisory Board to the Minister:** In order to identify industry priorities, and to establish a regular channel of communication, an advisory board of industry representatives could be established to advise the Minister of State for Mines and Energy.

(vi) **Prepare Policy Framework for Specific Minerals:** At present only coal, peat and potash have established policies for the government's role in development. Such policies for other minerals would help in planning the government role and stimulating development of other mineral resources, for example base metals, industrial minerals and precious metals. In addition, jurisdictional questions such as offshore minerals and resource ownership need to be clarified.

(vii) **Revise Administration of the Federal-Provincial Agreement on Mineral Development:** Criticism of federal-provincial agreements as a vehicle for mineral development has focused on the relatively short term of the agreements, duplication of administration, excessive bureaucracy, planning difficulties, and bridging of funds between agreements. Although difficulties with this approach are acknowledged, the agreements do provide substantial funding for important geoscience and technology development projects. It has been suggested that DNRE administer the provincial portion of the agreement or that the agreement 2funds become part of DNRE's "A" Base Budget.

DISCUSSION

The Mining Association of Canada (MAC) has expressed concerns about regulatory conditions, in particular "growing regulation," difficulty in compliance, uncertainty due to changing requirements (e.g. environmental standards), and overlap in

provincial and federal legislation. The MAC and Prospectors and Developers Association (PDAC) indicate that this situation creates delays, unnecessary costs and confusion. The industry is particularly concerned about delays in project approvals, increasing costs, onerous liabilities (e.g. mine reclamation costs) and market restrictions.

Over twelve separate approvals, permits and leases are necessary for mineral development. Most of these regulatory requirements are administered by DNRE and DOE respectively (See Figure 10, Appendix A). The present approval process for development of an ore body requires a minimum of one and a half years to complete, but a longer period would not be unusual depending on the information available and the nature of the issues associated with a particular proposal. Although a DNRE-DOE Standing Committee on Mining and Environment addresses some of the concerns internally, coordination of the approval process and government action needs to be improved significantly. Agency responsibilities need to be clarified, and regulatory requirements need to be consolidated, streamlined and communicated to companies and consultants. Industry has also requested that it be consulted in the development of new policies, standards and regulations, and that federal and provincial actions and requirements be harmonized (e.g. environmental assessment).

A fundamental concern, one which has caused continuing controversy, is access to and use of lands for mineral exploration and development. Access to land is increasingly being made difficult for mining because of conflicting land use policies. Residential development, for example, occurs without consideration of mineral resources and often eliminates the possibility of using nearby mineral resources.

Other concerns specific to mining which are impacted by government agencies other than DNRE include training (education and skills upgrading), human resource management and labour stability. These concerns are addressed in part by the Department of Advanced Education and Labour, however, improvements (e.g. in apprenticeships and specialized courses) are needed to serve the mining sector's special interests.

The Mineral Resources Division is responsible for managing the Province's mineral resources and administering the legislation in relation to mining leases, peat leases, quarry leases, quarry permits and reclamation, etc. DEDT, the Department of Municipalities, Culture and Housing (DMCH), the Department of the Environment, the Occupational Health and Safety Commission, other branches of DNRE, federal and provincial Departments of Finance, federal Energy Mines and Resources Canada are all involved in the mineral sector.

5.4 ENVIRONMENTAL CONCERNS

ISSUE:

Environmental concerns

OBJECTIVE:

To address mine reclamation issues and to incorporate the principles of sustainable development into the management of mineral resources

POLICY OPTIONS:

(i) **Prepare and Implement a Sustainable Development Strategy for the Mineral Sector in New Brunswick:** Implementation will require the incorporation of the principles of sustainable development into the legislation pertinent to mineral development activities.

(ii) **Support Research and Demonstration Projects:** Since new technology for mine reclamation and environmental protection is necessary to address environmental concerns, both industry and government are obliged to be involved in technology development and demonstration. At present, input from both industry and government for such purposes is limited. Options for government participation include funding for research and demonstration projects, other incentives, and providing research and planning expertise.

(iii) **Continue Support For Review of Tax Treatment of Reclamation Costs:** Mine reclamation costs generally occur after production and income generation have ceased. At present, the costs are deductible only in the year the expense was incurred (when income is low or has ceased) creating a disincentive for reclamation expenditures. A review of the implications of provincial taxation and continuation of support of changes to the federal tax structure are proposed. This issue was identified in 1985, and little progress towards a solution has been realized to date.

(iv) **Review of Requirements for Reclamation Security:** Several issues are associated with mine reclamation securities including duplication of security requirements under the Mining Act and the Clean Environment Act, liability questions, reclamation standards and difficulties with the form and calculation of the amount of the securities. The need to address these issues is highlighted by the serious environmental, cost, and timing implications of the securities and reclamation

work. In addition, a review of the issues should consider various types of operations, such as, producing mines, mine development on mineral claims, preliminary exploration work on mineral claims and the role government should take with respect to ongoing reclamation liability of mineral rights.

(v) **Establish Provincial Fund for Reclamation of Abandoned and Closed Mines:** Although there are some sources of funding for general environmental purposes (Environmental Trust Fund, Orphan Sites Fund), there is no source of government funding for reclamation of abandoned or closed mines. The large cost of reclamation work underlines the need to provide some form of funding to ensure that reclamation work is completed and environmental quality is protected.

(vi) **Establish Government-Industry Task Force on Environmental Issues:** Both government and industry have a responsibility to address present and future environmental issues associated with mineral sector activity. Coordination and cooperation will be required to identify and solve the environmental challenges, but at present there is no structure to address these government-industry concerns. The MAC has suggested that a task force be established to review the environmental performance of the mineral sector, suggest future emphasis, increase and promote awareness in the industry and the public regarding environmental performance, recommend objectives and standards for protection and reclamation, develop joint environmental emergency planning, define environmental liability and make recommendations regarding reclamation of abandoned or dormant mines.

DISCUSSION

Environmental concerns, such as sustainable development and mine reclamation securities, have not been fully incorporated into the management of mineral resources. Mineral development must occur in a deliberate manner that sustains the economic output, quality of life and environmental integrity for future generations. In other words, it is necessary "to meet the needs of the present without compromising the ability of future generations to meet their own needs" (federal Green Plan). Past mining and processing operations have had long-term environmental liabilities; such sources of contamination must be addressed and creation of new liabilities avoided. In general, impact management (e.g. water quality, land use), efficiency (e.g. waste reduction, recycling, conservation) and economic considerations (e.g. stability of markets, exchange rates, costs, labour) are central issues to mineral development and sustainable development. Planning for the mineral sector must be integrated with other government policies aimed at sustainable development such as the federal Green Plan. Waste reduction, reuse, recovery and recycling (the four R's) need to be incorporated into activities of the mineral sector.

Mining and processing operations use water, energy, and materials, disrupt stream and wildlife habitat, affect land use, produce air and water emissions and generate wastes requiring disposal or special treatment. In addition, mineral resources may not always be developed in an efficient manner, that is, utilizing both high grade and lower grade ores to recover full mineral value. It is necessary that full costs (including mine reclamation costs) be recognized. It has been estimated by the MAC that addressing the serious acid mine drainage problem in Canada would cost $3 billion or (2.4% of industry's gross revenue over 20 years). In New Brunswick, it has been estimated that reclamation of the Brunswick mines and Heath Steele mine, with their acid generating sources from past operations, will cost tens of millions of dollars.

The Premier's Round Table on Environment and Economy has recommended more community involvement in decision-making, planning adjustments for mine closures, promotion of reprocessing of tailings and recycling of metals, development of a code for sustainable development, review of reclamation funding, implementation of a user pay charge for environmental resources, requirement to reclaim sand and gravel pits, and a review of the sustainability of coal mining.

The provincial and federal Departments of the Environment and other agencies are involved in addressing sustainable development, but only DNRE and the local industry are specifically responsible for sustainable development of the mineral sector in New Brunswick. The Intergovernmental Working Group on the Mineral Industry is currently working on a proposed mine reclamation fund concept to address financing of mine closure costs.

Reclamation and post-closure obligations are major considerations affecting existing and future mine developments. Financial and technological constraints have limited the ability of mine developers to overcome these concerns. A strong incentive for research and development into reprocessing pyrite tailings is needed to recover the large amount of base metal and precious metal content and to ensure acceptable environmental conditions.

5.5 PUBLIC AWARENESS

ISSUE:

Poor public awareness of the mineral sector

OBJECTIVE:

To identify public concerns and to improve public information and awareness regarding the mineral industry

POLICY OPTIONS:

(i) **Establish Industry-Government Committee to Expand Public Information Program:** This option involves establishment of a joint committee (industry and DNRE) to plan and implement an expanded public information and awareness program focusing on the mineral sector. The Committee's activity would complement and continue the initiatives of the CAMD Public Information program (such as, advertising and public relations, displays, public information newsletter and photography collection). It would also complement the geoscience education initiatives described in Section 5.1.

(ii) **Survey Public Perceptions Regularly:** A periodic survey of public perception is suggested to identify public concerns and monitor the effectiveness of the public information program.

(iii) **Prepare Public Consultation Guidelines:** In the past, a variety of public consultation approaches have been used regarding mineral related issues and projects. Industry may find public consultation guidelines useful in anticipating and addressing conflicts related to public concerns.

DISCUSSION

A 1991 survey (Angus Reid) has indicated that the pubiic has a negative or poor perception of the mineral sector, specifically the level of Canadian ownership of mines, fairness of taxes for mining, pollution from mining, trust for government and industry in this area, productivity and safety, and the advanced technology used in mining. The public also does not appear to have a good understanding of the importance of the industry to the economy. The survey indicated that 35% of Canadians were pro-industry, 45% were concerned and 20% were antagonistic. In general, the public felt that the

government and mine executives have poor credibility concerning mining issues, but that the news media, unions and industry associations have more credibility. Environmental concerns are top priorities to the public. The negative perception or lack of knowledge leads to public pressure for additional regulation and inspection of mines. Many of the public perceptions appear to be unfounded and these perceptions adversely affect the industry.

In the past, there has been little concerted effort to address the poor public understanding of the mineral industry. Industry and government recognize that public perception needs to be addressed, and that appropriate data to support a public awareness campaign will be necessary. The mineral industry is seeking a model for a public awareness program, and an appropriate carrier for the information.

The government should strive to provide public information and consultation, ensuring that the public perception of the industry is based on a fair and accurate basis. An unfounded negative image damages the industry and investment potential. The 1990-95 CAMD public information program includes a newsletter, development of a photography bank, preparation of material for school curriculum, advertising the industry particularly through Mining Week and open houses, and, support for trade show displays. In addition, DNRE staff are involved in responding to mineral issues raised by the public (e.g. land use conflicts, environmental issues, and requests for information), promotion of the industry during Mining Week and public consultation on mining projects undergoing environmental impact assessment. The public perception survey indicated that parts of the present public information programs are not effective. The existing program is considered disjoint and sporadic.

5.6 NON-MINERAL USE OF GEOSCIENCE INFORMATION

ISSUE:

Demand for geoscience information for other uses

OBJECTIVE:

To provide geoscience information and input to planning and development projects not related to the mineral sector

POLICY OPTIONS:

(i) **Define Responsibility for Providing Geoscience Information:** The responsibility for providing geoscience information for planning and development projects (i.e. for non-mineral industry uses) needs to be clarified. The Geological Surveys Branch (GSB) of the Mineral Resources Division, DNRE appears to be an appropriate agency to adopt this responsibility.

(ii) **Establish Interdepartmental Committee to Identify Geoscience Needs:** An interdepartmental groundwater committee, involving the GSB and the DOE has recently been established to identify geoscience needs of DOE. It is proposed that other committees will be established by GSB to create a link to resource/land use management agencies (DOE, DOT, DMCH, DNRE) requiring geological information.

(iii) **Develop Geoscience Program:** Once the authority for providing geoscience information has been established and the nature of the geoscience needs have been identified, the design and implementation of a mapping and database program can proceed. This approach will assist in addressing conflicts with other jurisdictions and contribute to "integrated resource management."

DISCUSSION

In the past, the Geological Surveys Branch (GSB), DNRE, has served mainly the mineral sector, but now there are increasing demands for geoscience information and expertise for water, forest and waste management. The GSB is the only government agency collecting, collating, interpreting, and distributing geoscience data required for land use planning and other activities not directly related to the mining industry.

Such demands for geoscience information are varied. For example, both private and public sector interests require geoscience information for siting, designing and assessing impacts of solid waste management facilities. Geoscience information is also required for protecting groundwater resources (drinking water) and for investigation of groundwater (well water) pollution cases. Forest management planning by industry and by DNRE also relies on information about site conditions which includes soil (geoscience) information. Use of geoscience information in land use (municipal) and transportation is also very important. The Department of the Environment, DNRE, the Department of Transportation and the Department of Municipalities, Culture and Housing all have consulted with the GSB as the primary source of geoscience information. However, the GSB's mandate has in the past been limited to addressing demands of the mineral industry. Although the GSB provides expertise on a case by case basis, it is not involved in long term planning regarding, for example, Crown lands, timber management, transportation, municipal affairs and the environment.

Basic geoscience information is required for almost all planning and development work, but the existing geoscience information and expertise in the GSB is not fully recognized or utilized for its value outside the mineral industry needs.

Geoscience data gathering, interpretation and dissemination are very complex and expensive endeavours. Governments cannot afford to have geoscience expertise spread thinly throughout several departments. It would seem appropriate for the Geological Surveys Branch, DNRE, to provide the geoscience information and expertise for non-mineral uses. However, the GSB mandate would need to be revised to include such functions.

6.0 CONCLUSION

The challenge of sustaining and enhancing the benefits from the mineral sector requires a cooperative approach between industry, government and the public. Presenting the draft policy as a discussion paper provides an opportunity for industry and other interested parties to be involved in the development of the government's future role in the sector.

Recognizing the constraints in government financial resources, the review of government's role will result in identification of priority areas. The focus at present is on geoscience, technology development and in-province processing. Other issues requiring consideration include diversification, coordination within government, regulatory requirements, sustainable development, mine reclamation and public awareness.

In preparing the new policy, initiatives to address these areas of interest must also be selected. In general, the initiatives available to government include incentives, information and expertise, training, policies, programs and legislation. Priorities concerning funding, timing and human resources will be determined in the new policy.

With the new policy, the importance of the industry will be acknowledged and government support to the sector will be reaffirmed. A strong and competitive mineral industry will continue to provide significant benefits to the province.

7.0 REFERENCES

Davies, Dr. J. L. Zinc, Lead, Copper Reserves - Northern New Brunswick 1991

Department of Natural Resources and Energy Policy Review Mineral Resources - A Status Report Draft July 16, 1991

Department of Natural Resources and Energy New Brunswick's Mineral Industry 1990 Edited by B. Carroll 1990

Employment and Immigration Canada Terms of Reference for a Human Resource Study of the Canadian Mining Industry November 1991

Energy, Mines and Resources Canada The Mineral and Metal Policy of the Government of Canada May 1987

Energy, Mines and Resources, Mineral Policy Sector Sustainable Development and the Minerals and Metals Industry - A Draft Discussion Paper February 1991

Energy, Mines and Resources Canada A. Clark (personal communication, November 4, 1991

Government of New Brunswick Toward 2000 - An Economic Development Strategy for New Brunswick, 1988

Intergovernmental Working Group on The Mineral Industry (EMR) A Report on the Cleanup of Abandoned Tailings Through Reprocessing Operations July 1991

Mining Association of Canada Environmental Challenges to the Mining Industry The Mining Association Submission to the House of Commons Standing Committee on Energy, Mines and Resources September 1991

Mining Association of Canada Managing Canada's Mineral Endowment Brief presented to the 48th Annual Mines Ministers' Conference September 24, 1991

Nepisguit Economic Conference Chaleur Create the Wave 1991

New Brunswick Statistics Agency, N. B. Department of Finance The New Brunswick Economy - 1991 - A Report to the Legislative Assembly March, 1991

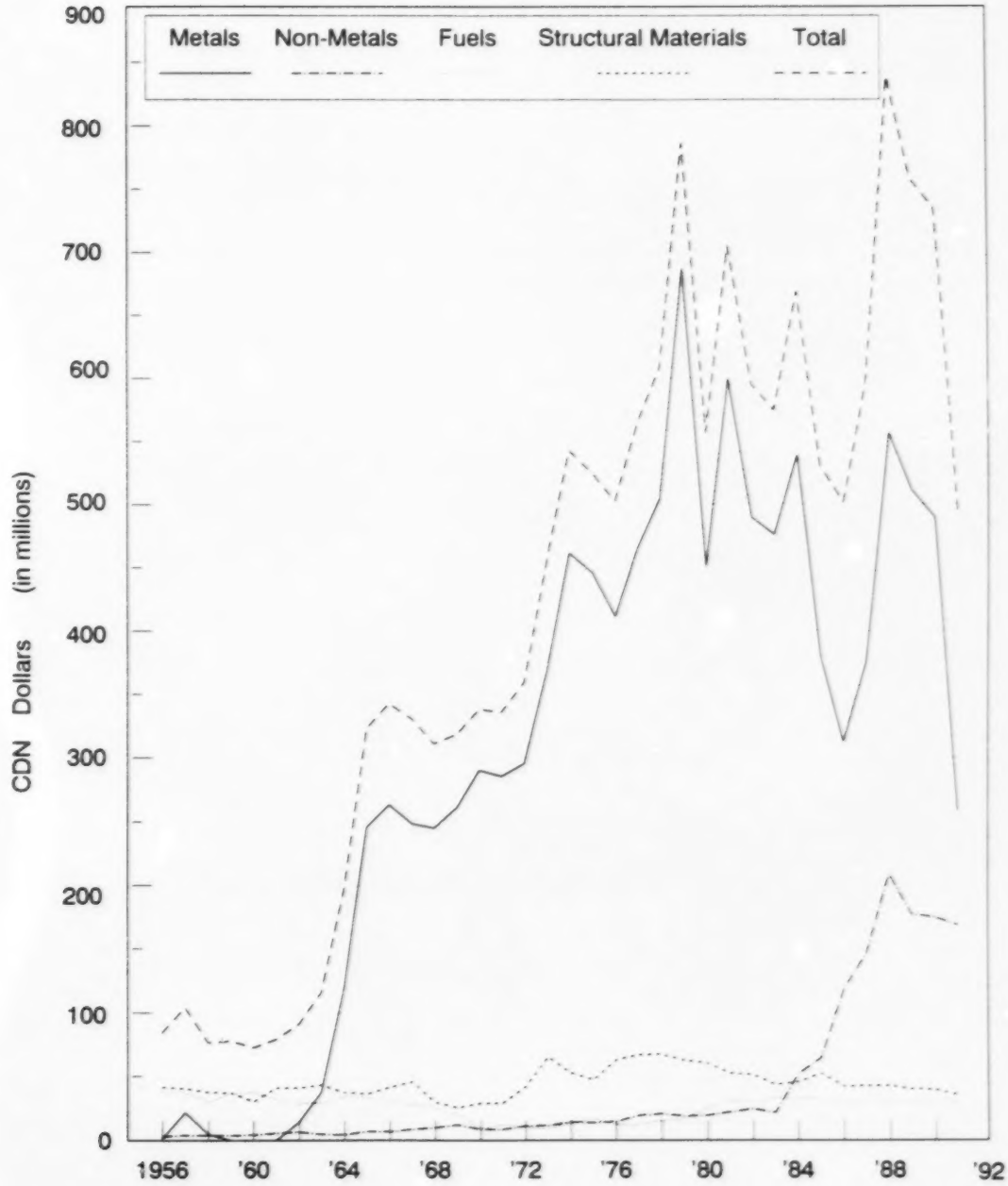
Porter, Michael E. Canada at the Crossroads - The Reality of a New Competitive Environment October 1991

Prospectors and Developers Association of Canada The Importance of the Mineral Industry to Canada Brief presented to the 48th Annual Mines Ministers' Conference September 24, 1991.

Supply and Services Canada Shaping Canada's Future Together - Proposals Cat. No. CP22-24/1991 ISBN 0-662-19152-8 1991

8.0 APPENDIX A

Figure 1. VALUE OF MINERAL PRODUCTION, 1956 -1991
(1986 Constant Dollars)



- The 1991 production value is preliminary.
- BM&S strike & lower zinc prices adversely affected 1991 production value.

Source: Statistics Canada

Figure 2. MINERAL PRODUCTION IN NEW BRUNSWICK, 1991

(Compiled from Energy, Mines and Resources statistics)

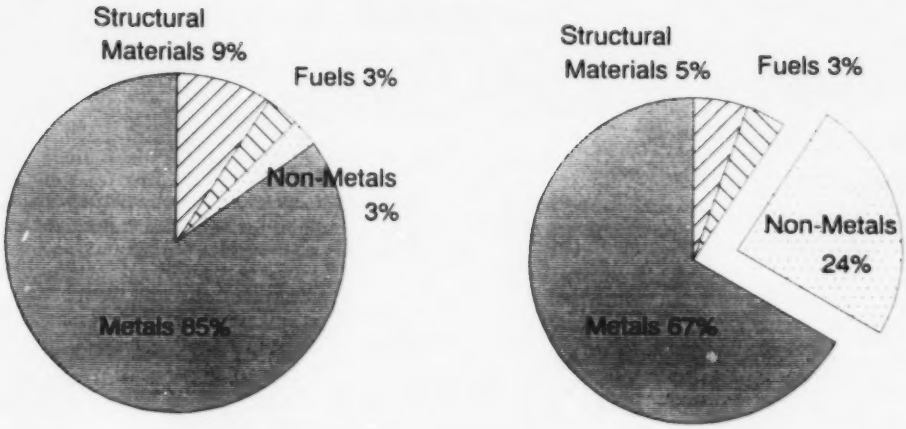
Preliminary Estimate

Commodity	Units	Quantity	Value ($)
Metals			
Antimony	kg	---	---
Bismuth	kg	130 000	975 000
Cadmium	kg	47 000	235 329
Copper	kg	10 138 182	27 534 795
Gold	g	---	---
Lead	kg	59 018 545	50 224 782
Silver	kg	153 057	22 869 012
Zinc	kg	169 886 900	212 528 512
TOTAL			325 545 700
Nonmetals			
Marl	t	---	---
Peat	t	280 056	26 934 202
Potash	t	---	---
Salt	t	---	---
Sulphur (in smelter gas)	t	46 960	6 546 507
TOTAL			212 321 987
Fuels			
Coal	t	500 000	34 200 000
Natural Gas		---	---
TOTAL	m^3		34 200 000
Structural Materials			
Lime	t	---	---
Sand and Gravel (including silica)	t	6 842 540	14 386 675
Stone	t	2 769 713	18 397 674
TOTAL			44 939 842
GRAND TOTAL 1991 (CDN $), preliminary			617 007 529

GRAND TOTAL 1990 (CDN $) $877 926 043

GRAND TOTAL 1989 (CDN $) $864 073 000

Figure 3. VALUE OF PRODUCTION BY COMMODITY (1975 vs 1989)

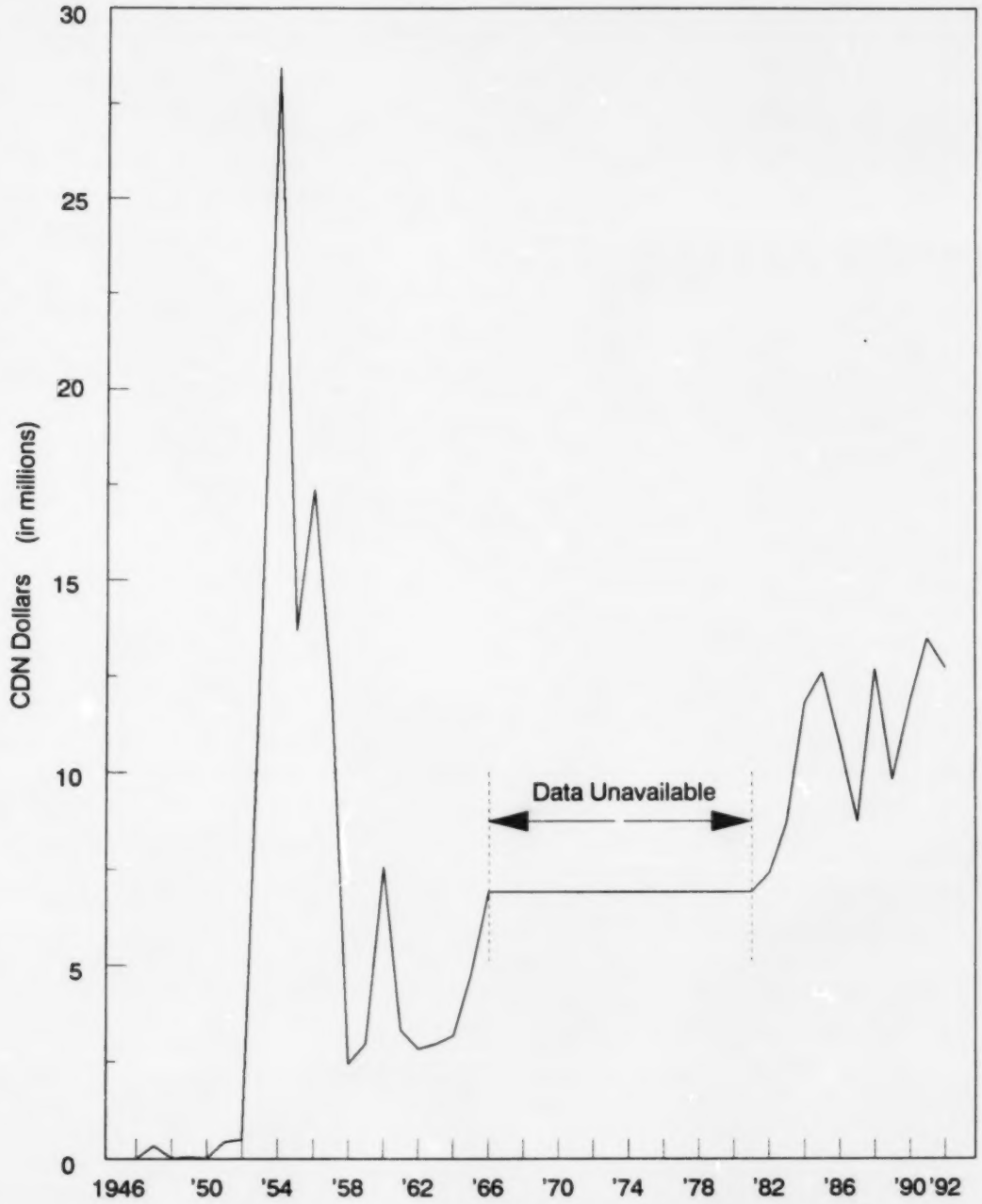


1975
$231,922,900

1989
$864,873,000

Source: Energy, Mines and Resources Canada

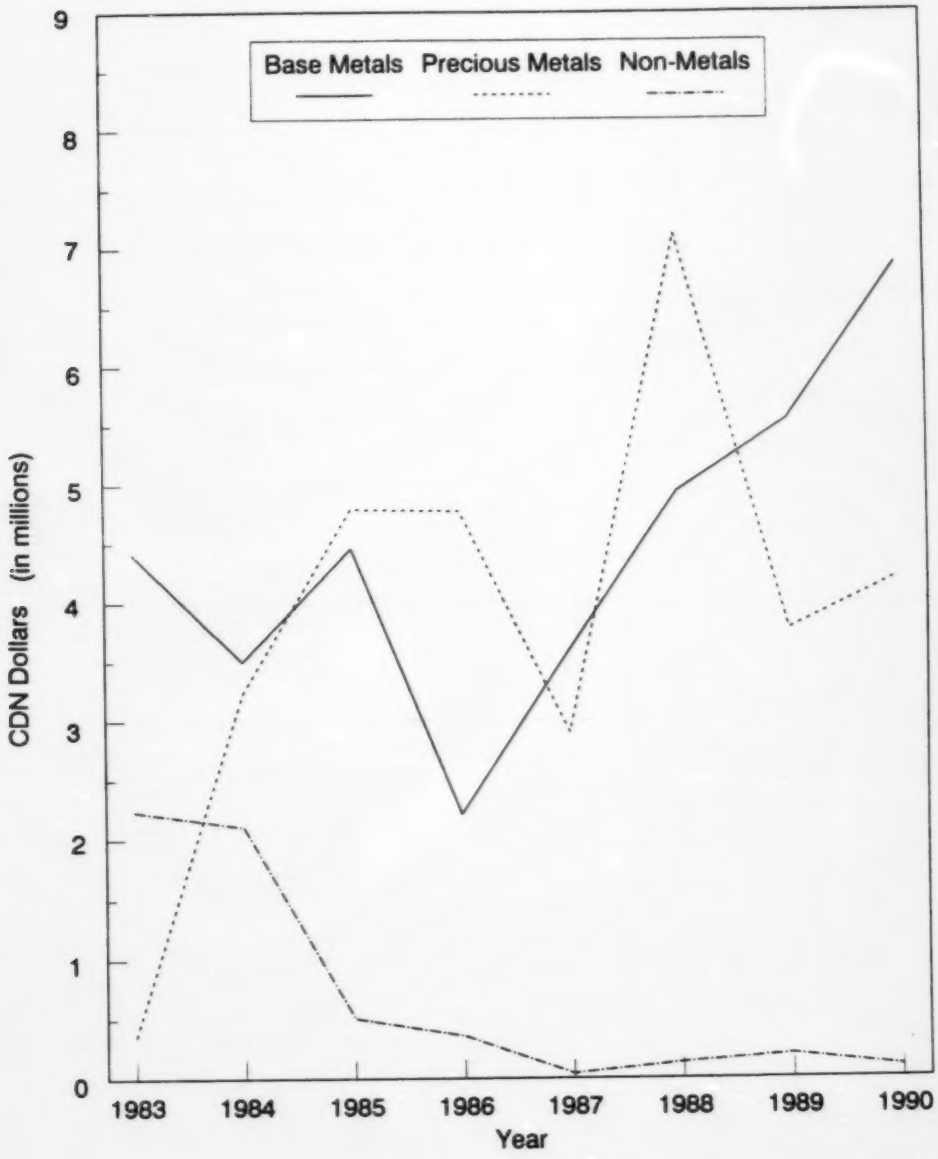
Figure 4. MINERAL EXPLORATION EXPENDITURES, 1951 - 1992
(1986 Constant Dollars)



- The 1992 value is projected. Data was unavailable for the period 1967-1981.
- Data is general plus mine site exploration, excluding overhead

Source: Energy, Mines and Resources Canada

Figure 5. EXPLORATION ACTIVITY BY COMMODITY, 1983 - 90
(1986 Constant Dollars)



- Exploration activity does not include mineral exploration for extension to deposits already being mined or committed to production.
- For 1987-1990, related overhead expenditures (land costs, administrative costs and exploration related head office expenditures) are not included.

Source: Energy, Mines & Resources Canada

Figure 6. MINERAL RESERVES AND ECONOMIC BENEFITS

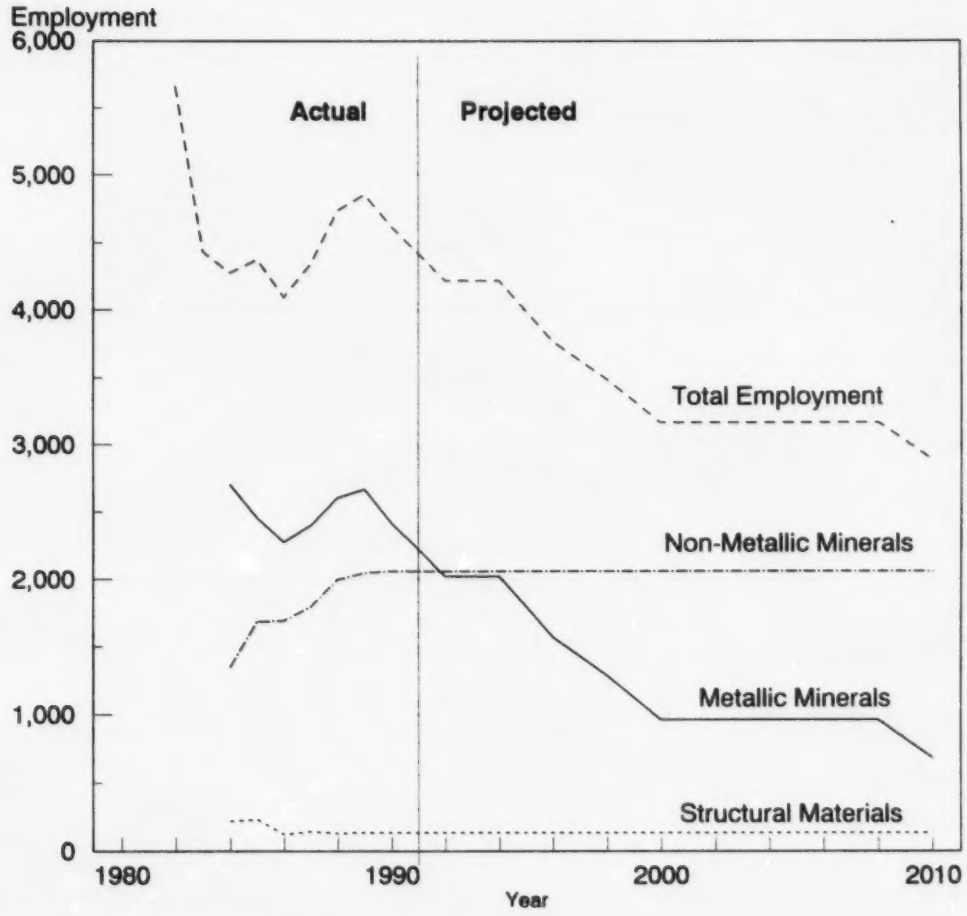
COMMODITY/ DEPOSIT/ MINE	RESERVES IN YEARS	EMPLOYMENT 1990	1990 VALUE OF PRODUCTION
Brunswick No. 12 Mine	24 ////////////////////	1440	–
Heath Steele Mine	6 //////	280	–
Murray Brook Mine	1–6 /	45	–
Stratabound Mine	–	–	–
Restigouche Deposit	(4)	–	–
Caribou Deposit	(7)	–	–
Halfmile Lake Deposit	(14)	–	–
Key Anacon Deposit	(1.5)	–	–
Stratmat (S–1) Deposit	(4)	–	–
Mount Pleasant Deposit	( )	–	–
BM&S Smelter	Expected Life >5 years	656	–
METALS		2421	$596 Million
Potash	>20 ////////////////// +	949	–
Coal	20 //////////	196	$37.4 Million
Peat Moss	>40 //////////////////// +	917 (seasonal)	$28.3 Million
Other	–	–	–
NON–METALS		2062	$244 Million
Structural Materials	–	135	$46 Million
STRUCTURAL		135	$46 Million
TOTAL FOR SECTOR		4730	$886 Million

Notes: New Brunswick's value of production is heavily dependent upon base metals.
Only Brunswick No. 12 mine and the potash, coal and peat moss operations have long term proven reserves (greater than 20 years). Fiveteen to twenty years of zinc reserves would be needed to feed a processing facility. Potential developments include a zinc smelter (400 jobs), extension of Brunswick No. 12 mine or the Heath Steele mine or other new mine (280 jobs), Mount Pleasant mine (250 jobs), Millstream potash facility (300 jobs), or other operations associated with limestone, dimenstion stone, or rare metals.

() Indicates that the reserves are not being mined

Source: Reserves are based on DNRE estimates.
Employment and value of production based on DNRE and EMR statistics

Figure 7. EMPLOYMENT IN MINERAL SECTOR
Actual (1980-1990) and Projected



Footnote:
- Assume no change in markets, productivity, technology, competition, reserves, or new processing capacity.
- Projected employment based on reserves and production forecasts.

Source: DNRE

Figure 8. PROJECTED YEARLY CONCENTRATE PRODUCTION FROM SELECTED SULPHIDE DEPOSITS.

Figures Based on the Following Recoveries: Zn 82%, Pb 64%, and Cu 57%

DEPOSIT	ORE RESERVES (Tonnes)	YEARLY PROD. ORE (Tonnes)	Zn Con. ((Tonnes (1))	Pb Conc. (Tonnes (2))	Bulk (Tonnes (3))	Cu Conc. (Tonnes (4))	MINE LIFE (Years- (from 1990)
Brunswick Mining & Smelting No. 12	88,000,000	3,740,000	440,000	186,000	73,000	34,000	24
Heath Steele Stratmat	3,153,000 681,000	821,250	100,000	19,000	5,000	16,200	6
Halfmile Lake	10,800,000	730,000	97,300	38,000			14
Caribou	5,428,000	730,000	81,060**	37,837**	126,000		7
Key Anacon	1,106,000	730,000	151,000*	71,860*			1.5
Murray Brook	5,302,000 298,000	912,000 298,000	61,000	10,250		 38,000	6 1
Restigouche	1,029,000 691,000	385,000	51,930	46,730			4
Stratmat S-1	2,800,000	700,000	78,000	37,000			4

* Total tonnage
** Tonnage Included in 126,000 bulk concentrate

(Source: Zinc, Lead, Copper Reserves - Northern New Brunswick - Dr. J.L. Davies, 1991)

Figure 9: MAJOR MINERAL DEVELOPMENTS IN NEW BRUNSWICK

Metallic mineral producer
Industrial mineral producer
Peat producer
Fuel producer
Deposit in development
Other deposit (Exploration)
Smelter
Heron Mines Ltd. (Turgeon) ZINC, COPPER
Brunswick Mining & Smelting Corp. Ltd. SMELTER, FERTILIZER PLANT
Grande Anse Peat Moss Co. Ltd. PEAT
Fisons Horticulture Inc. PEAT
Pokesudie Peat Moss PEAT
Chaleur Peat Moss Ltd. PEAT
Pigeon Hill Peat Moss Ltd. PEAT
Acadian Peat Moss (1979) Ltd. PEAT
Lameque Peat Moss PEAT
St. Rasmuse Peat Moss PEAT
Elmtree Resources Ltd. LIMESTONE
East West Caribou Mining Limited LEAD, ZINC
Elmtree Resources Ltd. LIMESTONE
Locana Mining Corp. Ltd. (Alcide) GOLD
Shamrock Resources Inc. (Nigadoo) LEAD, ZINC, SILVER
Elmtree Resources Ltd. SILICA
Murray Brook Resources Inc. GOLD, SILVER
Blue Mountain GRAVEL
Fisons Horticulture Inc. PEAT
Marshall Minerals Corp. (Restigouche) LEAD, ZINC
Brunswick Mining & Smelting Corp. Ltd. (Brunswick No. 12) ZINC, LEAD STONE FOR MINE BACKFILL
Key Anacon Mines Limited ZINC, LEAD
Neapsiquit Narrows GRAVEL
Bois Gagnon GRAVEL
Jiffy Products (N.B.) Ltd. PEAT
Canadian Supreme Products PEAT
Howeco Ltd. PEAT
Heath Steele Mines (Heath Steele - Stratmat) LEAD, ZINC
Burnt Church Peat Moss PEAT
Berger Mix Inc. PEAT
Satoturve Oy PEAT
Good Earth Canada Ltd. PEAT
Berger Mix Inc. PEAT
ASB Greenworld Ltd. PEAT
Brunswick Mining and Smelting Corp. Ltd., Granges Inc. (Chester) COPPER, LEAD, ZINC
Senogle River GRAVEL
Miramichi Peat Moss Ltd. PEAT
Theriault and Hachey Peat Moss Ltd. PEAT
LAC Minerals Limited (Costigan Mountain) ZINC, LEAD
Stratabound Minerals Corp. (Caribou North Extension) ZINC, LEAD, COPPER, SILVER
Desores Lake SAND
Maspec Peat Moss Ltd. PEAT
Kent Peat Moss PEAT
Provincial Holdings Ltd., St. Lawrence Cement Co. Ltd. (Beersville) COAL
Gill Pit GRAVEL
Upper Kent Lime Works Ltd. MARL
Burnthill TUNGSTEN
St. Lawrence Cement Co. Ltd. (Lake Stream) COAL
Smith Cut Stone and Quarries Ltd. PROCESSED STONE
Dubuis Cut Stone Ltd. PROCESSED STONE
Lafarge Canada Inc. LIMESTONE, GYPSUM
N.B. Coal Limited COAL
Havelock Lime LIMESTONE
Irving Oil Limited NATURAL GAS
Adocan Inc. ANTIMONY
Premier CDN Enterprises Ltd. PEAT
Nelson Monuments Ltd. PROCESSED STONE
Potash Company of America POTASH, SALT
West River GRAVEL
BP Resources Canada Limited POTASH, SALT
Canadian Occidental Petroleum Limited (Albert Mines) OIL SHALE
Brunswick Ready Mix Concrete Ltd. (Bloodon) GRAVEL
Sussex Silica Inc. SILICA
Denison-Pelican Potash Company SALT, POTASH
LAC Minerals Ltd., Billiton Metals Canada Ltd. (Mount Pleasant) TUNGSTEN, MOLYBDENUM
Brookville Manufacturing Co. Ltd. LIMESTONE, DOLOMITE
Maspec Resources Inc. GOLD
Gorges Minerals Limited GOLD
New Brunswick
NEW BRUNSWICK
DEPARTMENT OF NATURAL RESOURCES AND ENERGY
MINERAL RESOURCES
SCALE
MILES
KILOMETRES
NOVEMBER 1980
MAJOR MINERAL DEVELOPMENTS IN NEW BRUNSWICK

Figure 10

MINE APPROVAL PROCESS

New Brunswick

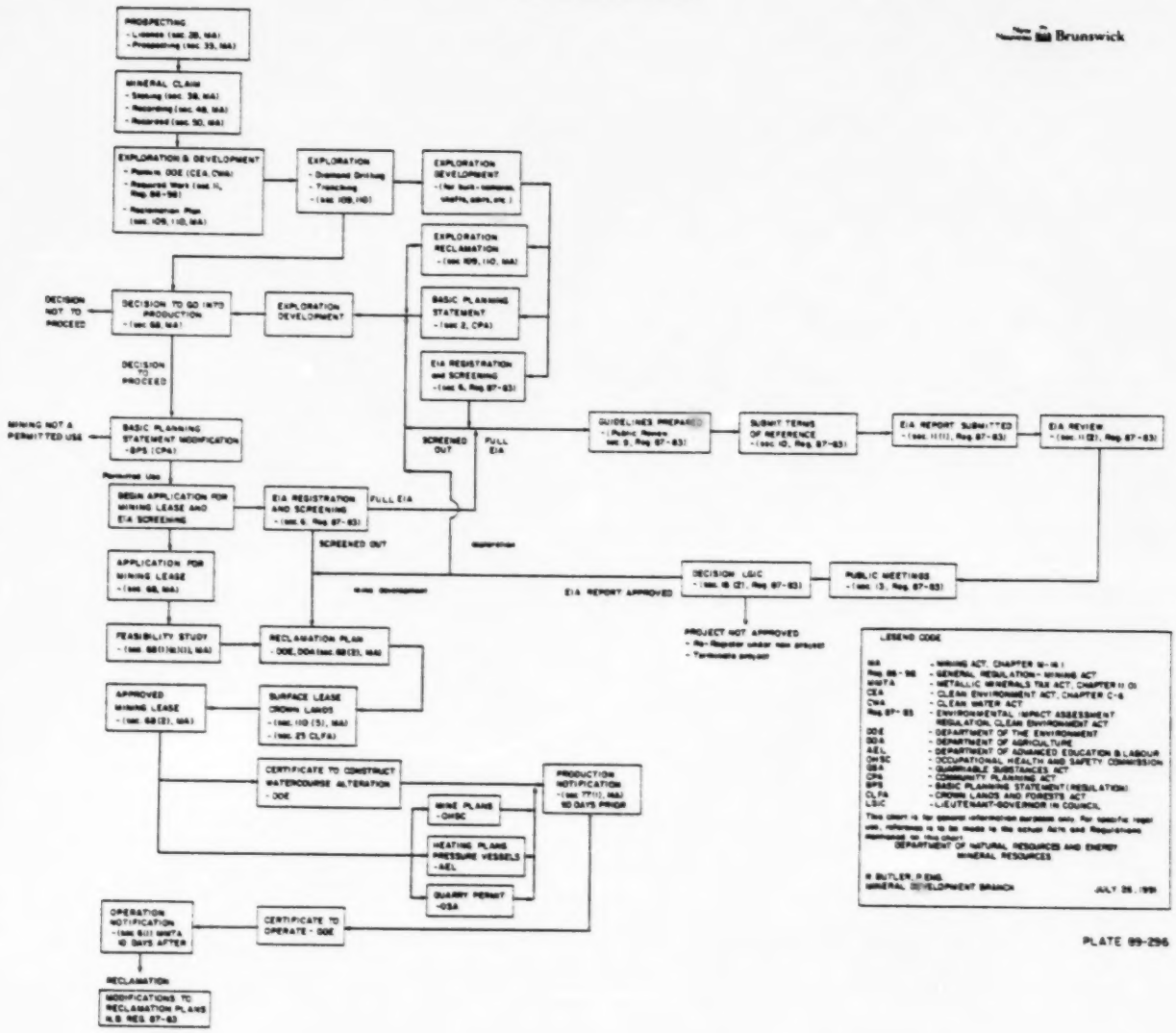

PROSPECTING
- Licences (sec. 28, MA)
- Prospecting (sec. 35, MA)
MINERAL CLAIM
- Staking (sec. 38, MA)
- Recording (sec. 48, MA)
- Renewal (sec. 50, MA)
EXPLORATION & DEVELOPMENT
- Permit: DOE (CEA, CWA)
- Required Work (sec. 11, Reg. 86-98)
- Reclamation Plan (sec. 109, 110, MA)
EXPLORATION
- Diamond Drilling
- Trenching
- (sec. 109, MD)
EXPLORATION DEVELOPMENT
- (for bulk - tonnage, shafts, adits, etc.)
EXPLORATION RECLAMATION
- (sec. 109, (10, MA)
DECISION NOT TO PROCEED
DECISION TO GO INTO PRODUCTION
- (sec. 68, MA)
EXPLORATION DEVELOPMENT
BASIC PLANNING STATEMENT
- (sec. 2, CPA)
EIA REGISTRATION and SCREENING
- (sec. 6, Reg. 87-83)
DECISION TO PROCEED
MINING NOT A PERMITTED USE
BASIC PLANNING STATEMENT MODIFICATION
- BPS (CPA)
SCREENED OUT?
FULL EIA
GUIDELINES PREPARED
- (Public Notice
sec. 9, Reg. 87-83)
SUBMIT TERMS OF REFERENCE
- (sec. 10, Reg. 87-83)
EIA REPORT SUBMITTED
- (sec. 11(1), Reg. 87-83)
EIA REVIEW
- (sec. 11(2), Reg. 87-83)
Permitted Use
BEGIN APPLICATION FOR MINING LEASE AND EIA SCREENING
EIA REGISTRATION AND SCREENING
- (sec. 6, Reg. 87-83)
FULL EIA
SCREENED OUT
Registration
APPLICATION FOR MINING LEASE
- (sec. 68, MA)
Mine Development
EIA REPORT APPROVED
DECISION LGIC
- (sec. 16 (2), Reg. 87-83)
PUBLIC MEETINGS
- (sec. 13, Reg. 87-83)
PROJECT NOT APPROVED
- Re-Register under new project
- Terminate project
FEASIBILITY STUDY
- (sec. 68(1)(c)(i), MA)
RECLAMATION PLAN
- DOE, DOA (sec. 68 (2), MA)
APPROVED MINING LEASE
- (sec. 68 (2), MA)
SURFACE LEASE CROWN LANDS
- (sec. 110 (5), MA)
- (sec. 25 CLFA)
CERTIFICATE TO CONSTRUCT WATERCOURSE ALTERATION
- DOE
PRODUCTION NOTIFICATION
- (sec. 77(1), MA)
60 DAYS PRIOR
MINE PLANS
- OHSC
HEATING PLANS PRESSURE VESSELS
- AEL
QUARRY PERMIT
- DNR
OPERATION NOTIFICATION
- (sec. 6(1) WMTA
10 DAYS AFTER
CERTIFICATE TO OPERATE - DOE
RECLAMATION
MODIFICATIONS TO RECLAMATION PLANS
e.g. Reg. 87-83
LEGEND CODE
MA - MINING ACT, CHAPTER M-14.1
Reg. 86-98 - GENERAL REGULATION - MINING ACT
MMTA - METALLIC MINERALS TAX ACT, CHAPTER M-10
CEA - CLEAN ENVIRONMENT ACT, CHAPTER C-6
CWA - CLEAN WATER ACT
Reg. 87-83 - ENVIRONMENTAL IMPACT ASSESSMENT REGULATION, CLEAN ENVIRONMENT ACT
DOE - DEPARTMENT OF THE ENVIRONMENT
DOA - DEPARTMENT OF AGRICULTURE
AEL - DEPARTMENT OF ADVANCED EDUCATION & LABOUR
OHSC - OCCUPATIONAL HEALTH AND SAFETY COMMISSION
QSA - QUARRIABLE SUBSTANCES ACT
CPA - COMMUNITY PLANNING ACT
BPS - BASIC PLANNING STATEMENT (REGULATION)
CLFA - CROWN LANDS AND FORESTS ACT
LGIC - LIEUTENANT-GOVERNOR IN COUNCIL
This chart is for general information purposes only. For specific legal use, reference is to be made to the actual Acts and Regulations mentioned on this chart.
DEPARTMENT OF NATURAL RESOURCES AND ENERGY
MINERAL RESOURCES
R. BUTLER, P.ENG.
MINERAL DEVELOPMENT BRANCH
JULY 26, 1989

PLATE 89-296